

Exam Code: 225103

Paper Code: 3217

Programme: Master of Science (Botany) Semester III

Course Title: Developmental Botany

Course Code: MBTL-3071

Time: 3 Hrs.

Max. Marks: 70

Note: Attempt five questions in all, selecting one question from each section. Fifth question can be attempted from any section. Each question carries 14 marks.

SECTION-A

- Q1) Discuss various methods used to overcome self- and interspecific incompatibility in plant breeding programs. 14
- Q2) Explain the functions of pollen wall proteins and stigma surface proteins in pollen recognition and the regulation of compatibility responses. 14

SECTION-B

- Q3) Describe the events from the entry of the pollen tube into the ovule up to the fusion of gametes. 14
- Q4) Define Endosperm. Differentiate between the various types of endosperm according to their patterns of development. 14

SECTION-C

- Q5) a) Describe the polarization of the zygote and its significance in embryo development. 7
- b) Describe the technique and significance of embryo culture in rescuing hybrid embryos. 7
- Q6) What is a seed? Describe the structure and development of seeds in angiosperms. 14

SECTION-D

- Q7) Describe the diagnostic embryological characters used in plant taxonomy. 14
- Q8) a) Discuss the causes and consequences of endosperm dysfunction in hybrid seeds. 7
- b) Differentiate between primitive and advanced embryological characters with examples. 7

Exam Code: 225103

Paper Code: 3218

Programme: Master of Science (Botany) Semester III

Course Title: Plant Molecular Biology

Course Code: MBTL-3072

Time: 3 Hrs.

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

Section - A

Q1) Explain any two methods of DNA sequencing. What are the other names of Sanger sequencing method and Maxam-Gilbert method? 12, 2

Q2) Describe:

- a) RNA processing with diagram of spliceosomal splicing
- b) Transcriptional unit
- c) Promoter region

8, 3, 3

Section - B

Q3) Write about:

- a) Various types of endonucleases
- b) Host cell restriction
- c) Antibiotic resistance markers

6, 3, 5

Q4) Answer the following:

- a) Explain the process of Agarose gel electrophoresis.
- b) Write definition and functions of DNA ligase, Topoisomerases and Methylases.

8, 6

Section - C

Q5) Describe with diagram:

- a) Ti- plasmid
- b) Bacteriophage

7, 7

Q6) What are cloning vehicles? Give their features and importance with suitable examples.

2, 12

Section - D

Q7) Describe (with diagram/ flowchart, wherever required):

a) RFLP

b) PCR

7, 7

Q8) Write the definition, methods involved and applications of:

a) Protein profiling

b) Bioinformatics

7, 7

Exam Code: 225103

Paper Code: 3219

Programme: Master of Science (Botany) Semester III

Course Title: Plant Breeding and IPR

Course Code: MBTL-3073 ✓

Time: 3 Hrs.

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

Section A

1. What is sexual reproduction? Describe the process of gametogenesis in plant with the help of suitable diagrams.
2. Define domestication and briefly discuss the concept of centres of origin with the list of various centres of origin of cultivated plants.

Section B

3. Define heterosis. Discuss the physiological and molecular basis of heterosis and achievement in crop improvement.
4. Briefly describe the procedure of recurrent selection. Discuss the achievements through this method of breeding.

Section C

5. Briefly explain gene for gene relationship. Describe the backcross method of breeding for disease resistance governed by a recessive gene.
6. Explain the different types of correlation estimated in breeding materials and discuss their implications in plant breeding.

Section D

7. How to produce interspecific hybrid and briefly describe types of polyploidy and use in crop improvements.
8. Write short notes on the following:
 - a. Trade secrets and Trips
 - b. UPOV Acts and PPVFR act (2001)

Exam Code: 225103

Paper Code: 3220

Programme: Master of Science (Botany) Semester III

Course Title: Plant Biochemistry

Course Code: MBTL-3074

Time: 3 Hrs.

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

Section - A

- Q1. Explain the structure and properties of water, along with its biological importance? (14 marks)
- Q2. Explain in detail about Handerson-Haselbach equation? (14 marks)

Section - B

- Q3. Describe the glycolytic process along with its corresponding enzymes? (14 marks)
- Q4. Explain the role of acetyl coenzyme-A in cellular metabolism? (14 marks)

Section - C

- Q5. Describe the process of beta-oxidation of fats in plants? (14 marks)
- Q6. Explain the biosynthesis and regulation of cholesterol in plants? (14 marks)

Section - D

- Q7. Explain the mechanism of enzyme catalysis? (14 marks)
- Q8. Write brief notes on
- a) Specificity of enzyme and its types. (7 marks)
 - b) Enzyme induction and repression (7 marks)

Exam Code: 225103

Paper Code: 3221

Programme: Master of Science (Botany) Semester III

Course Title: Applied Botany

Course Code: MBTL-3075

Time: 3 Hrs.

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 14 marks. Draw labelled diagrams wherever necessary.

Section-A

1. Write notes on the following:
 - i) Spices and Condiments (5)
 - ii) Fruits (4)
 - iii) Fumitory substances (5)
2. Define beverages. Discuss the processing of Tea. (14)

Section-B

3. Discuss important commercial woods of India w.r.t their botanical characteristics, wood properties, and applications. (14)
4. Explain the industrial manufacturing of plywood and its classification based on their use. (14)

Section-C

5. Differentiate between essential oils and vegetable oils. Give classification, botanical description and uses of any two-essential oil yielding plants. (14)
6. Give classification of Fibres. Mention physical and chemical processes involved in manufacturing of fibres. (14)

Section-D

7. Describe the source of commercial rubber, the extraction of latex, its processing into rubber, and the various applications of rubber. (14)
8. What are natural dyes? Describe the methods of their extraction and discuss the advantages and disadvantages of plant-based dyes. (14)

Exam Code: 225103

Paper Code: 3222

Programme: Master of Science (Botany) Semester III

Course Title: Plant Morphogenesis

Course Code: MBTL-3076

Time: 3 Hrs.

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. The fifth question may be attempted from any section. Each question carries 14 marks.

Section – A

- Q1) a) Give a brief account on the genetical correlations in plants.
b) Explain the physiological manifestations of polarity. $7 \times 2 = 14$
Q2) How the polarity is expressed internally? Explain diagrammatically. 14

Section – B

- Q3) Explain the concept and types of symmetry in plants. 14
Q4) Define differentiation and explain the process of differentiation expressed internally in plants. 14

Section – C

- Q5) a) Discuss regeneration in higher plants.
b) Write a note on restoration and reconstitution. $7 \times 2 = 14$
Q6) Explain the role of somatic mutations in plant morphogenesis. Also, write a note on stock-scion relationships. 14

Section – D

- Q7) What are amorphous structure and how they are influencing plant morphogenesis. 14
Q8) Discuss the genetical and chemical factors affecting the development of plant morphogenesis. 14